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On the whole, I am inclined to align them with Giebel's long-known species *Lipeurus assessor*. Giebel described the species from specimens taken from the South American condor, *Sarcophagus gryphus*. Piaget found it again on the same host and Carriker has taken it on the king vulture, *Gypagus papa*, in Costa Rica. As the range of the king vulture and the California condor almost overlap (the king vulture is said to occur occasionally in Arizona) it is, at first thought, not surprising that the single parasite species is common to all three of these great American vultures.

Osborn has found a *Lipeurus* on the turkey buzzard (*Cathartes aura*) in Iowa, but describes it as distinct from *assessor* under the name *marginalis*. His specimens (two) are smaller by a third than *assessor* and have their markings "confined to the narrow marginal lines."

The single *Menopon* specimen, a female, can also, I think, be ascribed to an already known species, namely *Menopon fasciatum*, collected by Rudow from the South American condor (*Sarcophagus gryphus*) and by Carriker from the king vulture (*Gypagus papa*). The exact determination of this *Menopon* species is made very difficult, if not impossible, by Rudow's incomplete description, but Carriker's figure and what there is of the original description correspond too well with my specimen from the California condor to make necessary the establishment of a new species for it.

It is highly interesting—at least it is to me—to find two parasitic species common to all three of the great vultures of the American Cordillera. But the range of these birds, although extending north and south for several thousand miles, is nearly continuous when the three species are taken as one host type. Looked at in this way the geographical range of the parasites seems explicable. But when we keep in mind the facts that the host type is really a compound of three taxonomically quite distinct units—they represent three separate genera to the ornithological systematist—and that the individuals of each of these host units are particularly non-gregarious,

even solitary, birds, preventing, almost certainly, any actual bodily contact between individuals of the different species and, except at mating and nesting time, any such contact even among individuals of any one of the species—when we face these facts the distribution of these wingless parasite species comes to assume the interest and importance of a problem. What is its solution?

I can simply reiterate my belief, already several times previously declared, that such cases can only be explained on the assumption of the occurrence of the parasite type on the common ancestor of all three of the related (although generically distinct) host types, and its persistence practically unchanged on each of the diverging descent products from this original ancestor-host.

VERNON L. KELLOGG
STANFORD UNIVERSITY, CAL.

FUR-SEALS DOMESTICATED

UNTIL a few months ago, no authentic instance was on record of Alaska fur-seals (*Callorhinus alascanus*) being fed in captivity and living for any length of time in other than their natural environment. Apocryphal tales exist on the Pribilof Islands of fur-seals having been tamed and living thereafter in the habitations of human beings on the islands. In the early seventies, the Alaska Commercial Company placed two immature live fur-seals, exact ages not definitely known, in Woodward's Gardens in San Francisco, which were confined within an enclosure, and which died of starvation after several months' incarceration, having eaten nothing during the interval.

This experiment at Woodward's Gardens fixed the idea that fur-seals would not feed in captivity. In view of this belief, it is specially interesting to announce that Mr. Judson Thurber, boatswain on the revenue cutter *Bear*, has succeeded in inducing two fur-seal pups to take food voluntarily and in keeping them alive and well in captivity from October 9, 1909, until the present time. A brief account of this successful experiment is given.

The effort had its inception in the desire of

Dr. Fox, the surgeon of the *Bear*, to ascertain whether the fur-seal carried ectoparasites. For this purpose, a starving fur-seal pup, whose mother had been killed while feeding at sea, was given to the *Bear's* surgeon, who was unable to discover any of the parasites mentioned. The half-starved little animal was then taken by Mr. Judson Thurber, the *Bear's* boatswain, who desired to attempt feeding the pup by artificial means. He was so far successful in his efforts that he induced this pup to eat dried fish from his hand and kept it in good condition for three weeks, when it died in convulsions. Desiring to carry the experiment farther, Mr. Thurber obtained two well-conditioned fur-seal pups, a male and a female, from the Pribilof Islands on October 9, which he induced to eat regularly and even greedily, and which now are fat and in prime condition.

The chronology of the experiment follows:

October 9.—Two pups delivered to Revenue Cutter *Manning*.

October 14.—Pups delivered by *Manning* to *Bear*—did not eat between these dates.

October 19.—Female began eating solid fish.

October 23.—Male chloroformed and frenum severed.

October 28.—Male induced to swallow a little dried salmon.

November 2.—Male began to eat at will, and on that date ate with evident relish nine small fresh herring at Seattle.

Mr. Thurber began his experiments by forcing condensed milk down the throat of the starving pup first obtained. In doing so he discovered that the animal experienced difficulty in swallowing and attributed this to the fact that the movement of the tongue was restricted by the frenum. This Mr. Thurber at once severed forcibly with his finger, upon which the pup soon after began to eat fish. After the death of this pup and his securing the two others, the same impediment to the free movement of the tongue was noted. The female, it is stated, succeeded in breaking the frenum by her own efforts and a few days afterwards began to eat. The male being unable to do this, on October 23 he was chloroformed and his frenum cut. Immediately after this, the male began to protrude its

tongue and to nose the fish in its enclosure, but did not eat, possibly because no suitable food was obtainable at sea. Upon the arrival of the vessel at Seattle small herring were fed to the pups and both animals ate greedily.

The female was by far the easier to feed, was without food for only ten days and has been in good condition during the whole of her captivity. The male, however, was virtually without food from October 9 until November 2, a period of twenty-four days, during which time he grew thin rapidly and was a pitiful sight beside his fat and sleek-looking companion. Since he began feeding, however, he fattened daily and now is as well-conditioned as the female.

The pups have been kept on board the *Bear* in a box six feet long by three feet wide. At first this box was filled with sea-water two or three times a day. Now the box is kept filled with water during the day and is emptied at night. They manifest no desire to leave the water during the day and frequently sleep on the surface. In the morning, when the box is filled with water, they show every indication of delight. They are very tame and, when not in the water, will allow any one to fondle them unless a quick motion is made, when they will snap, but even then will bite gently if the hand is allowed to remain quiet.

In conducting this experiment Mr. Thurber used great patience and no little skill. He began feeding the animals by holding their mouths open and pouring into their mouths evaporated cream mixed with bits of fish. The pups resented this, but small quantities went into their stomachs. Later, Mr. Thurber would tie bits of fish on the end of a string and tease the animals until they would snap at the fish. Then he would manage to poke the fish down the seal's throat and cut off the string. In this way the female was taught the taste for fish, after which she soon learned to eat voluntarily.

These animals, the only captives of their kind in the world, are now thriving on board the *Bear* and it is hoped soon to bring them to Washington, where they will be placed in the large pool at the Bureau of Fisheries. Mr. Thurber is entitled to all credit for his suc-

cess in demonstrating the practicability of a measure hitherto believed impossible of accomplishment. The greater portion of the foregoing data was furnished by Captain E. P. Bertholf of the *Bear*.

The result of Mr. Thurber's experiment is to establish the possibility of feeding fur-seals in captivity. Incidental to this is the interesting disclosure seemingly demonstrated by three examples under observation that the frenum in the fur-seal young at first opposes an obstacle to their taking solid food, and that its rupture is a prerequisite to their feeding on other substances than mother's milk. Should this be proved by subsequent experimentation, the knowledge may open up a wide field of endeavor, having as its object the saving from death of those fur-seal nurslings whose mothers have been killed at sea, and which now die a lingering death from starvation.

BARTON W. EVERMANN,
WALTER I. LEMBKEY

BUREAU OF FISHERIES,
WASHINGTON, D. C.

SOCIETIES AND ACADEMIES

THE BIOLOGICAL SOCIETY OF WASHINGTON

THE 462d meeting was held November 27, 1909, with President Palmer in the chair.

Mr. A. S. Hitchcock referred to the many changes in nomenclature in recent years, and pointed out that much of this change was inevitable. He illustrated the changes that must follow from increased knowledge of the history of grasses, by examples from Otto Kuntze and showed how some of Kuntze's conclusions were nullified by an early paper by Rafinesque.

Professor Bartsch, referring to a recent paper by Professor Spillman, called attention to the attempts of Mr. D. H. Talbot, of Sioux City, Iowa, during the eighties to breed a solid-hoofed hog in order to overcome the foot disease. Hog cholera carried off all but two of the selected animals which had only partially solid hoofs. From the progeny of these by selection and breeding a race of solid-hoofed hogs was obtained, specimens of which were seen by the speaker in the early nineties.

The chair called attention to the consummation of what may be considered the first international

game preserve. This preserve consists of two separate reservations—one established by the state of Minnesota and the other by the province of Ontario. These two reservations adjoin the international boundary. For several years a bill to establish a game refuge in northern Minnesota has been pending in Congress but has failed to pass. Last February by proclamation of the President the Superior National Forest was established in Minnesota, and shortly after a bill was passed by the state legislature prohibiting the hunting of game animals or birds in national forests, state parks and such other lands in the state of Minnesota as the game commission might set aside as game refuges. Under this law the Superior State Game Preserve, comprising about 1,000,000 acres, and including all of the Superior National Forest and some other lands adjoining the international boundary, has recently been established. Still more recently the province of Ontario has set aside an equal area as the Quetico National Forest immediately adjoining the Minnesota reservation on the north. The combined area of the two reservations is about 2,000,000 acres.

Mr. Howell described a case of semi-domestication of a wild bird, the myrtle warbler, in the drug store of Union Station at Washington. Mr. H. W. Clark noted a somewhat similar instance at Lake Maxinkuckee, Ind., in 1906.

The following communications were presented:

Observations on the Mammals of the Mammoth Cave: A. H. HOWELL.

The paper gave the results of a visit to the cave in late June and early July. The habits of the cave rat (*Neotoma pennsylvanica*) were described and specimens exhibited which had been captured in the cave. Mention was made of the occurrence of three species of bats in the cave in winter; none is found there, however, during the summer months.

The Distribution of Color in the Seeds of Cowpeas: C. V. PIPER.

In the seeds of cowpeas, the following colors are met with where the seed is uniformly colored: black (really very dark violet), violet, maroon, pink, buff, cream, white, marbled brown and buff, speckled blue on buff. In many varieties of cowpeas, however, especially where the body is white, the other color is always distributed in definite types: (1) *Small-eyed* with a small amount of color about the hilum. (2) *Large-eyed* with a large amount of color about the hilum. (3) *Saddled* with a very large amount of color cen-